

	Specification	Peaking
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Title: **The Removal and Isolation of the Drakensberg Headrace Charge-up Valves**

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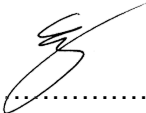
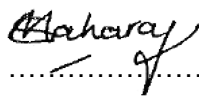
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TABLES

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1. INTRODUCTION

The Drakensberg Pumped Storage Scheme dewatering of the penstock is achieved by lowering the maintenance gate (stop logs) while the penstock is fully in-watered. Two charge-up valves fitted across the stop logs are used to regulate the water pressure in between the stop logs and the emergency gate. During the application of the stop logs, the charge-up valves are closed by means of a hand wheel fitted to a spindle to remove the water between the stop logs and the emergency gate. The stop logs are used for isolation of the penstock. The penstock may then be safely de-watered.

To remove the stop logs after completion of a penstock de-watering the area between the stop logs and the emergency gate is flooded by opening the charge-up valves which causes the stop logs to release from the sealing surface. The stop logs can then be removed.

The charge-up valves are fitted in the charge-up line which is 35 m below the surface of the water, and it is extremely difficult and costly to perform maintenance on the valves. Therefore, it is proposed to close the charge-up valves and to fit a blanking flange to the inlet side of the valve if possible, or if they are corroded to the extent that it cannot be closed to remove both valves and blank off the charge-up line by fitting a blanking flange to isolate it.

The two charge-up valves on both intake gates are both defective and cannot be closed, resulting in a large volume of water passing through the valves during the application of the stop logs, causing difficulty in the sealing of the stop logs as well as dewatering of the penstock

A replacement charge-up valve mechanism and procedure is proposed which does not form part of the scope of this document.

2. SUPPORTING CLAUSES

2.1 SCOPE

- The underwater inspection of the charge-up valves and the taking of photos and videos of the charge-up valves
- If possible, the complete closing of the charge-up valves
- If charge-up valves cannot be closed, due to foreign object blockage or corrosion, then removal of the valve.
- The blanking of the charge-up line by means of a bolt-on blanking flange.

2.1.1 Purpose

The purpose of this Technical Specification is to permanently isolate the headrace charge-up valves

2.1.2 Applicability

This document shall apply to Peaking and is to be used as an input to the associated works Information.

2.2 NORMATIVE/INFORMATIVE REFERENCES

Parties using this document shall apply the most recent edition of the documents listed in the following paragraphs.

2.2.1 Normative

- [1] ISO 9001 Quality Management Systems.

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[2] 240-53114002 Engineering Change Management Procedure

2.2.2 Informative

None

2.2.3 Disclosure Classification

Controlled disclosure: controlled disclosure to external parties (either enforced by law, or discretionary).

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3. DESCRIPTION OF THE *WORKS*

3.1 Executive overview

The *works* is the inspection and taking of photos/videos of the charge-up valve and piping to evaluate the best solution for the closing and/or isolation of the charge-up valves. Specific photos/video of the condition of the charge-up valve, the orientation and size of the flanges as well as the condition of the spindle coupling, and the inlet and outlet piping are required. Photos and videos are submitted in standard format, i.e. (.jpg, .mp4)

There are two charge-up valves per intake gate. It is proposed to isolate one intake gate charge-up valve set at a time since a full station outage is required to do both

The charge-up valves and operating mechanisms are inspected for any signs of corrosion, loose or missing bolts and damaged piping. A functional test (opening and closing) is performed to assess the correct operation of the charge-up valves. If the charge-up valves are operable the valves are fully closed by the *Contractor* and blanked off on the inlet side.

In the event of the charge-up valves being found in-operable, the charge-up valves are removed by the *Contractor* and the outlet flange blanked off. Blanking flanges and fasteners are provided by the *Employer*. The nominal bore of the outlet flange is ø200 mm and requires 4 bolts and nuts.

The maximum depth of the water at the headrace gates is approximately 35 meters, underwater visibility may be limited due to sediment in the water.

3.2 *Employer's objectives and purpose of the works*

The motivation is ensuring that the maintenance and emergency gates of Drakensberg Pumped Storage Scheme, which serve as primary isolations are in fully operational condition.

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4. MANAGEMENT AND START UP

4.1 Engineering quality assurance requirements

Not applicable.

4.2 Training workshops and technology transfer

Not applicable.

5. ENGINEERING AND THE *CONTRACTORS* DESIGN

Not applicable.

5.1 *EMPLOYERS* DESIGN

Not applicable.

5.2 PARTS OF THE WORKS WHICH THE *CONTRACTOR* IS TO DESIGN

None.

5.3 PROCEDURE FOR SUBMISSION AND ACCEPTANCE OF *CONTRACTOR'S* DESIGN

Not applicable.

5.4 OTHER REQUIREMENTS OF THE *CONTRACTOR'S* DESIGN

Not applicable.

5.5 EQUIPMENT REQUIRED TO BE INCLUDED IN THE WORKS

All equipment required to perform the removal and isolation of the charge-up valves are supplied by the *Contractor*.

5.6 AS-BUILT DRAWINGS, OPERATING MANUALS AND MAINTENANCE SCHEDULES

Not applicable.

6. PROCUREMENT

6.1 PLANT AND MATERIALS

6.1.1 Quality

Due to the nature of the works, in the event of a defect notified, the *Contractor* submits proposal to the *Employer* on the method of repairing or replacing defective items.

6.1.2 Guarantee Inspection

Not applicable.

6.1.3 Product Support

Not applicable.

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6.1.4 Defects correction

Not applicable.

6.1.5 Plant & Materials provided “free issue” by the *Employer*

Blanking flanges and fasteners provided by the *Employer*.

6.1.6 *Contractor's* procurement of Plant and Materials

Not applicable. All Plant and Materials used to perform the *works* are procured by the *Contractor*.

6.1.7 Spares and consumables

All spares and consumables such as tools and cutting disks are provided by the *Contractor*.

6.2 TESTS AND INSPECTIONS BEFORE DELIVERY

Not applicable.

6.3 MARKING PLANT AND MATERIALS OUTSIDE THE WORKING AREAS

Working area only at headrace tower and platform.

6.4 *CONTRACTOR'S* EQUIPMENT (INCLUDING TEMPORARY WORKS).

Not applicable, no special equipment to be procured by *Contractor* which may influence the progress of the *works*.

6.5 CATALOGUING REQUIREMENTS BY THE *CONTRACTOR*

Not applicable.

7. CONSTRUCTION

Not applicable

7.1 TEMPORARY WORKS, SITE SERVICES & CONSTRUCTION CONSTRAINTS

7.1.1 *Contractor's* equipment

Contractor keeps record of all equipment used.

7.1.2 Equipment provided by the *Employer*

Employer provides no equipment related to perform the *works*.

7.1.3 Site services and facilities

Employer provides electricity, water, and fire protection equipment.

7.1.4 Facilities provided by the *Contractor*

Not applicable, duration of *works* is 12 hours.

7.1.5 Existing premises, inspection of adjoining properties and checking work of Others

Not applicable.

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7.1.6 Survey control and setting out of the works

Not applicable.

7.1.7 Excavations and associated water control

Not applicable.

7.1.8 Underground services, other existing services, cable and pipe trenches and covers

Not applicable

7.1.9 Sequences of construction or installation

Not applicable.

7.2 COMPLETION, TESTING, COMMISSIONING AND CORRECTION OF DEFECTS

7.2.1 Work to be done by the Completion Date

	Item of work	To be completed by
	The 2 off charge-up valves to be isolated and or blanked off	On completion date

7.2.2 Use of the works before Completion has been certified

Not applicable.

7.2.3 Materials, facilities and samples for tests and inspections

Not applicable.

7.2.4 Commissioning

Not applicable. *Contractor* to close and isolate the charge-up valves only and no commissioning is required.

7.2.5 Start-up procedures required to put the works into operation

Not applicable.

7.2.6 Take over procedures

Take over at time of Completion.

7.2.7 Access given by the *Employer* for correction of Defects

In the event of a defect the *Employer* allows the *Contractor* access to the works to repair a defect.

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7.2.8 Training and technology transfer

Not applicable.

7.2.9 Operational maintenance after Completion

Not applicable.

8. PLANT AND MATERIALS STANDARDS AND WORKMANSHIP

8.1 INVESTIGATION, SURVEY AND SITE CLEARANCE

Not applicable.

8.2 BUILDING WORKS

Not applicable.

8.3 CIVIL ENGINEERING AND STRUCTURAL WORKS

Not applicable.

8.4 ELECTRICAL & MECHANICAL ENGINEERING WORKS

Not applicable.

8.5 PROCESS CONTROL AND IT WORKS

Not applicable.

9. LIST OF DRAWINGS

9.1 DRAWINGS ISSUED BY THE *EMPLOYER*

This is the list of drawings issued by the *Employer* at or before the Contract Date and which apply to this contract.

Note: Some drawings may contain both Works Information and Site Information.

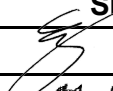
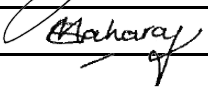
Drawing number	Revision	Title
0.48/382	A	Headrace Contract Intake Structure Arrangement and Details
0.48/2806	1	Gate Valve Screens
0.48/2542	3	Bypass
0.48/2914	1	Emergency Gates Linking Rods General Arrangement

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10. ACCEPTANCE

This document has been seen and accepted by:

Name & Surname	Designation	Signature
T. L. Keyser	SEM Turbine Systems	
S Maharaj	Peaking Engineering Manager	

11. REVISIONS

Date	Rev.	Compiler	Remarks

12. DEVELOPMENT TEAM

The following people were involved in the development of this document:

I.C. Meyer

13. ACKNOWLEDGEMENTS

None

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